

Remarks

This is in response to the Office Action mailed January 11, 2005. Claims 1 and 9 have been amended. Claims 1-10 and 12-16 remain pending. Reexamination and reconsideration in view of the amendments above and the following remarks are respectfully requested.

Anticipation Rejections

Claims 9 and 13 were rejected under 35 U.S.C. §102(b) as anticipated by Kobayashi, et al., U.S. Patent No. 4,750,371. These rejections are respectfully traversed.

Claim 11 previously depended from and further limited claim 9. In the Office Action, the Examiner objected to claim 11 as depending from a rejected base claim but indicated the claim would be allowable if rewritten in independent form. Claim 9 has been amended to include the limitations of claim 11 and claim 11 has been cancelled.

Applicants submit that claim 9, including the limitations of allowable claim 11, is now in condition for immediate allowance. Claim 13 depends from and further limits claim 9. Applicants submit that claim 13 is now in condition for immediate allowance. Reexamination and reconsideration of claims 9 and 13 are respectfully requested.

Obviousness Rejections

Claims 1 to 5 were rejected under 35 U.S.C. §103(a), as obvious over Kobayashi, et al., U.S. Patent No. 4,750,371. These rejections are respectfully traversed.

Claim 1, as amended, recites in part that a 50% duty ratio of the excitation power supply (V_{cc}) is used as a reference voltage (V_{ref}) to indicate a midpoint of the AC excitation signal (V_{sin}). This enables supply of a reference voltage that accurately indicates the midpoint of the excitation signal irrespective of any error or fluctuation occurring in the excitation power supply. Even in the case of operation using a mono power supply, a large-amplitude excitation signal can be generated that is free of upper or lower imbalance with respect to the reference voltage as the

midpoint. Torque detection accuracy is enhanced by the improved accuracy in the reference voltage.

Kobayashi, as shown in FIGS. 9, 11 and 13, while having exciting coils 411, 421, 431 and 441 connected to an oscillator (AC power source) 45, does not have a corresponding reference voltage generator (pulse generator 232) connected to oscillator 45. Further, Kobayashi does not teach or suggest that a reference voltage be defined with regard to a particular value produced by one of the other elements within the system disclosed. Without some teaching or suggestion of a correlation between reference voltage and excitation power supply, as recited in the claims, Applicants submit that there is not teaching or suggestion as to a particular ratio between the two. Thus, Kobayashi does not teach or suggest the use of a reference voltage defined by a ratio of the excitation power supply, as recited in claim 1.

Applicants submit that claim 1 is not rendered obvious by the cited prior and that claim 1 is in condition for immediate allowance. Claims 2 to 5 depend from and further limit claim 1. Applicants submit that claims 2 to 5 are not rendered obvious by the cited prior art and that claims 2 to 5 are in condition for immediate allowance. Reexamination and reconsideration of claims 1 to 5 are respectfully requested.

Claim 7 was rejected under 35 U.S.C. §103(a) as obvious over Kobayashi in view of Hanazawa, U.S. Patent No. 5,307,690. This rejection is respectfully traversed.

Claim 7 depends from and further limits claim 1. Claim 7 recites that the output of the detector coil is added by a bias voltage. As noted above, Applicants submit that Kobayashi does not render claim 1 obvious. Hanazawa is cited by the Examiner solely to introduce the limitation found in claim 7, that of adding biasing voltage to the coil. There is not teaching or suggestion within Hanazawa to have the reference voltage defined by a ratio of the excitation power supply. Without such teaching or suggestion, the cited references cannot render claim 7 obvious.

For at least these reasons, Applicants submit that claim 7 is not rendered obvious by the cited prior art and claim 7 is in condition for immediate allowance. Reexamination and reconsideration are respectfully requested.

Claim 12 was rejected under 35 U.S.C. §103(a) as obvious over Kobayashi. Claim 15 was rejected under 35 U.S.C. §103(a) as obvious over Kobayashi in view of Hanazawa. These rejections are respectfully traversed. Claims 12 and 15 depend from and further limit claim 9. As discussed above, claim 9 has been amended to incorporate the limitations of claim 11, which the Examiner indicated as being patentable. As amended, claim 9 is thus allowable over the cited prior art. Applicants submit further that claims 12 and 15 are similarly not rendered obvious by the cited prior art and are in condition for immediate allowance. Reexamination and reconsideration are respectfully requested.

Allowable Subject Matter

Applicants appreciate the Examiner's indication that claims 6, 8, 10, 11, 14 and 16 would be allowable if rewritten in independent form. With the amendments to claims 1 and 9, as discussed above, Applicants submit that claims 6, 8, 10, 11, 14 and 16 are in condition for immediate allowance and reexamination and reconsideration are respectfully requested.

App. No. 10/727,828

Office Action Dated January 11, 2005

Conclusion

In view of the above amendments and remarks, Applicant respectfully requests a Notice of Allowance. If the Examiner believes a telephone conference would advance the prosecution of this application, the Examiner is invited to telephone the undersigned at the below-listed telephone number.

Respectfully submitted,

MERCHANT & GOULD P.C.
P. O. Box 2903
Minneapolis, Minnesota 55402-0903
(612) 332-5300

Date:

May 10, 2005

By

Timothy R. Conrad

Timothy R. Conrad
Reg. No. 30,164
TRC:lmb

23552

PATENT TRADEMARK OFFICE